

REMARKS

This Amendment is responsive to the Office Action mailed on December 22, 2006. Claims 1-15 are pending before the amendment. Claim 15 has been amended. In view of the foregoing amendments, as well as the following remarks, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

Rejections of Claims under 35 U.S.C. § 112, 2nd Paragraph

Claim 15 stands rejected under 35 U.S.C. § 112, 2nd Paragraph. Applicants have amended claim 15 to remedy a typographical error in the claim dependency. Applicants request that the Examiner withdraw the rejection.

Rejections of Claims under 35 U.S.C. § 102(e)

Claims 1-11 and 13-15 over Wasshuber

Claims 1-11 and 13-15 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Pub. No. 2003/0111699 to Wasshuber (hereinafter *Wasshuber*). The Examiner contends that *Wasshuber* shows all elements of the rejected claims. Applicants respectfully disagree for the reasons set forth below.

Wasshuber fails to disclose “an island of a semiconductor material” and “an insulating layer disposed between said island and said handle wafer,” as set forth in Applicants’ claim 1. *Wasshuber* discloses an implanted region (512) formed by implanting “a desired species (e.g., such as carbon, germanium, oxygen, or the like)” into the semiconductor material of the substrate (514) to introduce tensile or compressive stress that is transferred to a channel region (524). *See* Paragraphs [0035], [0042]. However, *Wasshuber* fails to disclose that the implanted region (512) constitutes an insulating layer. In particular, *Wasshuber* fails to disclose that the

semiconductor material in the implanted region (512) is modified by the implanted species such that the semiconductor material in region (512) is somehow transformed into an insulator. A person having ordinary skill in the art understands that an insulator has significantly different electrical properties than a semiconductor material.

In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. *See* MPEP § 2131. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. Because *Wasshuber* fails to disclose “an insulating layer disposed between said island and said handle wafer,” *Wasshuber* fails to anticipate claim 1. Consequently, Applicants request that the Examiner withdraw the rejection.

Claim 1 is patentable for additional reasons. Specifically, assuming *arguendo* that the implanted region (512) constituted an insulating layer as alleged by the Examiner but disputed by the Applicants, *Wasshuber* fails to disclose “said insulating layer containing a thickened region underlying said strained region.” *Wasshuber* fails to disclose that the insulating layer identified by the Examiner, that is implanted region (512), has any portion that has a different thickness than any other portion. Instead, *Wasshuber* merely discloses that the presence of the implanted species changes “the lattice structure of the silicon” in the implanted region (512) by volumetric expansion or contraction. *See, e.g.*, Paragraph [0021]. *Wasshuber* fails to disclose that any portion of the implanted region (512) expands or contracts by a different amount than any other portion of the region (512).

In the preceding remarks, Applicants have established that *Wasshuber* fails to disclose “said insulating layer containing a thickened region underlying said strained region.” It follows logically that *Wasshuber* fails to disclose “said thickened region transferring tensile stress to said strained regions,” as also set forth in Applicants’ claim 1. Instead, *Wasshuber* discloses that the implanted region (512) of the semiconductor substrate (514) is modified by expansion for

transferring the tensile stress to the implanted region (512). A person having ordinary skill in the art would have understood that the semiconductor substrate (514), which is expanded by the implanted region (512) to transfer stress to the channel region (524), is not an insulating layer with a thickened region.

Wasshuber also fails to disclose “said insulating layer electrically isolating said island of said semiconductor material from said handle wafer,” as also set forth in Applicants’ claim 1. *Wasshuber* fails to disclose that the channel region (524), which the Examiner has identified as the claimed “island,” is electrically isolated from the substrate (514). Furthermore, Figure 22 of *Wasshuber* reasonably discloses and suggests to one of ordinary skill in the art that gaps comprising semiconductor material of substrate (514) are disposed between the implanted region (512) and the isolation structures (535a, 535b). Consequently, *Wasshuber* does not disclose that the substrate (514) identified by the Examiner as the claimed “handle wafer” and channel region (524) identified by the Examiner as the claimed “island” are electrically isolated from each other, as expressly required by Applicants’ claim 1.

Because of these additional deficiencies in the disclosure of *Wasshuber*, claim 1 is not anticipated by *Wasshuber* for at least these additional reasons. Hence, Applicants request that the rejection be withdrawn.

Wasshuber fails to contain any suggestion to modify the disclosure to remedy the various deficiencies. Because claims 2-11 and 13-15 depend from claim 1, Applicants submit that these dependent claims are also patentable for at least the same reasons as claim 1. Furthermore, each of these dependent claims recites a unique combination of elements not disclosed or suggested by *Wasshuber*.

Claims 1-4, 6-12, 14, and 15 over Yeo

Claims 1-4, 6-12, 14, and 15 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Pub. No. 2004/0150042 to Yeo et al. (hereinafter *Yeo*). The Examiner contends that *Yeo* shows all elements of the rejected claims. Applicants respectfully disagree for the reasons set forth below.

Yeo fails to disclose “said insulating layer containing a thickened region underlying said strained region,” as set forth in Applicants’ claim 1. In particular, *Yeo* fails to disclose that the insulating layer (54) identified by the Examiner has any portion with a different thickness than any other portion. In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. *See* MPEP § 2131. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. Because *Yeo* fails to disclose “said insulating layer containing a thickened region underlying said strained region,” *Yeo* fails to anticipate claim 1. Consequently, Applicants request that the Examiner withdraw the rejection.

Claim 1 is patentable for additional reasons. In the preceding remarks, Applicants have established that *Yeo* fails to disclose “said insulating layer containing a thickened region underlying said strained region.” It follows that *Yeo* fails to disclose “said thickened region transferring tensile stress to said strained region,” as also set forth in Applicants’ claim 1. Instead, *Yeo* merely discloses that a strained silicon layer (56) is provided on the insulating layer (54). *Yeo* does not disclose that the insulating layer (54) transfers stress in any manner or by any mechanism to the strained silicon layer (56).

In fact, *Yeo* discloses in Paragraph [0031] that:

The thickness of the strained silicon layer ranges from 10 angstroms to 500 angstroms which may be formed by a layer transfer technique. An example of a layer transfer technique is a wafer bonding step followed by a wafer separation step. In the wafer bonding step, a donor wafer comprising a strained silicon layer overlying a relaxed

silicon-germanium layer is bonded to a target wafer comprising a silicon oxide layer overlying a silicon substrate, such that the strained silicon layer is in atomic contact with the silicon oxide layer. In the subsequent wafer separation step, the strained silicon layer is separated from the donor wafer so that a new final wafer is formed comprising a strained silicon layer overlying a silicon oxide layer which is (*sic*) turn overlies a silicon substrate.

Consequently, *Yeo* discloses in Paragraph [0031] that the silicon layer (56) is strained before layer (56) is bonded by a “layer transfer technique” to the insulating layer (54) of “silicon oxide” on a “target wafer.” Instead, Paragraph [0031] of *Yeo* discloses that the silicon layer (56) is strained when deposited on a “relaxed silicon-germanium layer” on a “donor wafer” and before the silicon layer (56) is bonded to the insulating layer (54). Because *Yeo* fails to disclose “said thickened region transferring tensile stress to said strained region,” *Yeo* does not anticipate claim 1. Consequently, for at least this additional reason, Applicants request that the rejection be withdrawn.

Yeo fails to contain any suggestion to modify the disclosure to remedy the various deficiencies. Because claims 2-4, 6-12, 14, and 15 depend from claim 1, Applicants submit that these dependent claims are also patentable for at least the same reasons as claim 1. Furthermore, each of these dependent claims recites a unique combination of elements not disclosed or suggested by *Yeo*.

Conclusion

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe fees are dues in connection with filing this communication. If, however, any fees are necessary as a result of this communication, the Commissioner is hereby authorized to charge any under-payment or fees associated with this communication or credit any over-payment to Deposit Account No. 23-3000.

Respectfully submitted,

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Date

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